SEPTEMBER 1955

MARKETING ACTIVITIES

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
Washington 25, D.C.

IN THIS ISSUE

MAINTAINING QUALITY - SAVES MONEY FOR EVERYONE
By W. T. Pentzer... Page 3

What brings about quality losses in agricultural commodities during marketing? And what can be done to prevent them? Mr. Pentzer, Chief, Biological Sciences Branch of AMS, discusses these aspects of maintaining quality in agricultural commodities as they move from farm to consumer.

INTRODUCING A NEW FOOD PRODUCT
By Robert E. Branson, Milton Jacobs, and Richard Hall........ Page 9

The citrus industry used modern marketing methods to introduce a new product, frozen grapefruit sections. The authors, who are with the Market Development Branch of AMS, report on the results of the surveys their agency made on consumer acceptability and the market potential for the new product in Erie, Pa., a test city.

RIPER PEACHES FOR RETAIL SALE
By W. H. Redit, M. A. Smith, and P. L. Benfield............. Page 11

More information on USDA's research on developing the best methods for precooling peaches before shipment, refrigerating them during transit, and determining the effects of these practices. The authors are staff members of the Biological Sciences Branch of AMS.

TRUCK ROUTING BY CODE
By Theodore H. Allegri.....................................Page 14

The chore of routing delivery trucks can be made easier by using the simple flexible code outlined in this article. The author is with the Transportation and Facilities Branch of AMS.

HAULING FLORIDA PRODUCE BY RAIL AND BY TRUCK
By Ezekiel Limmer.. Page 18

The author, a transportation specialist with the Transportation and Facilities Branch of AMS, discusses some factors which influence shippers of Florida fruits and vegetables in deciding whether to use railroads or trucks.

Volume 18 No. 9

Address all inquiries to:
Editor, MARKETING ACTIVITIES
Agricultural Marketing Service
U. S. Department of Agriculture
Washington 25, D. C.

A monthly publication of the United States Department of Agriculture. The printing of this publication has been approved by the Director of the Bureau of the Budget (March 24, 1953). Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at a subscription price of $1.50 a year (domestic), $2 a year (foreign), payable by check or money order. Single copies are 15 cents each.

Maintaining Quality Saves Money For Everyone

By W. T. Pentzer

How do you feel about losing $507,838,000 a year? You didn't lose all of it yourself, of course. But you lost part of it--if you transported, handled, or sold fruits and vegetables. Or you lost part of it if you used some of your "take-home" pay to buy these commodities and then had to throw some away because they spoiled or lost quality. Or you lost part of it if you stored grain or seed at some time during the marketing year.

That's what U. S. Department of Agriculture specialists estimate was the total spoilage loss in a recent year for 20 important fruits and vegetables at terminal markets, retail stores, and in homes. The $507,838,000 also includes losses, other than insect damage, on grains and seeds during storage.

Of course, some of that loss will take place every year. Quality losses occur in most commodities--they are no longer "farm fresh" when they reach the consumer. But all too frequently more than loss of flavor or of attractive appearance occurs. The product often becomes unfit for use because of molds, yeasts, bacteria, insects, or because of undesirable physiological or chemical changes in composition.

Quite a bit of that spoilage loss can be stopped. And for a number of years the Department has conducted research aimed at reducing losses in food products. The Quality Maintenance and Improvement Section, Biological Sciences Branch, Agricultural Marketing Service, does research on agricultural products to determine quality changes that take place during marketing. It seeks also to develop methods for preventing undesirable changes and promoting desirable ones. (For additional information on the functions of this agency see MARKETING ACTIVITIES, December 1954.)

IDENTIFYING THE CHANGES IN QUALITY

The first step in correcting practices that lead to spoilage is to identify correctly the condition in question. Too often reports of shipments of produce in trouble give the cause in such vague terms as "decay breakdown" or "rot." It is important to know what kind of decay is involved, and to distinguish between a physiological trouble such as breakdown and decay due to micro-organisms.

Qualified inspection agencies will help you identify the trouble.

The Department has issued a series of handbooks on market diseases of the important fruit and vegetable crops, to help to identify causes of spoilage. When the trouble has been identified, there is a better chance to uncover the cause of the loss. Prevention of spoilage and loss of quality calls for a close study of the commodity itself. Fruits and vegetables are a good beginning because they offer some special problems.

Fruits and Vegetables

Respiration.--In fruits and vegetables we have a class of agricultural commodities that are alive. The thousands of cells that make up the plant or plant part that we know as a fruit or vegetable carry on living processes. They need oxygen to live. Through a process known as respiration, they oxidize sugars or acids with the help of enzymes. They give off carbon dioxide and generate heat. Respiration, a tearing down process, uses up some of the substance of the cell.

To prevent fruits and vegetables from losing quality, respiration must be slowed down. Sometimes fruits and vegetables go on a binge and live too fast, using up food reserves. After a week or two of such dissipation, they become the worse for wear. Keep an apple in an overheated fruit store long enough and it will lose all of its juicy, crisp texture. It will show symptoms of old age and senescence. Keep an apple in cold storage and it will stay young, full of vim and vigor for months.

Why is this? Research has shown that temperature exerts a powerful control over respiration and other chemical changes. An apple at 70° F. ripens as much in a day as it would in 10 days at 32°. Respiration rates are good indicators of the pace at which the fruit or vegetable is living. For every 18° F. rise in temperature, say between 32° and 80°, there is a 2- to 3-fold increase in respiration rates. This holds true for many other chemical reactions and emphasizes the basic role of refrigeration in preserving perishable foods.

Molds and bacteria.--As crops grow in the orchard and field, they become covered with mold spores and bacteria. This is reasonable to expect, for the soil and air carry millions of micro-organisms. Most fruits and vegetables have protective layers of specialized, heavy walled cells that make up the skin or epidermis. These cells form a good barrier against the entrance of micro-organisms. But if the skin is injured, the mold spores or bacteria find a good medium in which to work in the juice of the injured cells.

Most of the micro-organisms on the fruit or vegetable, which may be several million in number, are not decay producers. But there are enough decay producers on hand to start trouble if the opportunity arises. Some molds can gain entrance without assistance of careless workers, thanks to powerful cell wall dissolving enzymes they produce. But mechanical injuries are usually the site of infections.

Micro-organisms respond to temperatures much like the fruit and vegetables themselves respond. Low temperatures slow their growth, and

warm temperatures up to about 90° F. accelerate growth. High humidity or free moisture is necessary to germinate mold spores, which are much like seeds in this respect and in their function as propagators of the fungi that produced them. So keeping fruits and vegetables warm and humid usually increases infection.

Physiological diseases cause spoilage.--Some diseases of fruits and vegetables are not caused by decay-producing organisms. Common scald of apples is one example. It causes the skin of apples to turn brown. Scald is the most serious storage disorder of apples. It appears in some seasons and not in others. Oiled paper, used as wrappers or as shredded paper in the container, is widely recognized as a necessary requirement for scald control. Prompt refrigeration and delaying harvest until the fruit has reached full maturity are also important control measures. Breakdown of the flesh of apples and pears, usually a sign of overmaturity or old age, is another physiological trouble.

Potatoes and apples sometimes develop blackheart or brownheart when they are held in unventilated places or at too high temperatures. This is a disease due to a lack of sufficient oxygen for the cells to carry on respiration. Death of cells results; then the black color develops. All fruits and vegetables are subject to injury if they are deprived of oxygen. For this reason, prepackagers of fruits and vegetables should perforate the plastic film used for this purpose. The holes in the film let in oxygen for the fruit or vegetable to use, let carbon dioxide escape. Fruits and vegetables held at warm temperatures in tight containers will almost always develop off-flavor and odors in a few days.

Temperatures that are too cold, but short of freezing, cause some physiological diseases of fruits and vegetables. Bananas can be chilled by temperatures lower than about 55° F. Failure to ripen, susceptibility to decay, and poor blotchy color are symptoms of chilling injury which may appear if tomatoes are held too long at cold temperatures. Pitting of the skin of grapefruit is another symptom of chilling injury. Immature fruit of small sizes are most susceptible to the trouble.

PREVENTING CHANGES IN QUALITY

With a better understanding of the requirements of the commodity and the most likely cause of deterioration, protective measures can be worked out that will prevent the losses that are now experienced. Some commodities are considered here briefly to report on the troubles encountered and new things tried to prevent spoilage.

Apples and Pears

In the Pacific Northwest decay control has been improved by a wash of sodium orthophenylphenate. This is now used widely in commercial practice. It might be helpful in other apple growing sections. One of the newest methods of extending storage life of pears is packing them in polyethylene film-lined boxes, sealing the film. The pears, through respiration, build up the carbon dioxide content of the air in the box to about 3 or 4 percent (normal air has about 0.5 percent) and the

oxygen level is reduced to about 17 percent from a normal of 20 percent. This change in atmospheric composition is sufficient to suffocate the pears slightly, putting them to sleep, and to extend storage life about 6 weeks to 2 months.

When pears are removed from storage the film must be perforated to let the pears get enough oxygen to ripen properly. As long as they are held at low temperatures, pears can stand this treatment. It is in commercial use for western pears and was used for about one million boxes of the 1954 crop.

Carrots

New refrigeration problems have come with the widespread use of consumer-size film bags for topped carrots. When carrots were shipped with tops on, they were packed in crates with crushed ice and the load was covered with ice. Now the shipper may decide to use fiberboard cartons for film bags of carrots. These shipments cannot be iced in the package or top-iced. Some shipments have shown as much as 35 percent decay on arrival. The remedy is to cool the carrots before packing, either by hydrocooling, icing the water in the washer, or icing the trucks of topped carrots as they come from the field.

Eggs

Eggs deteriorate with age because of chemical changes. These take place in the yolk and white, through the action of micro-organisms, and by absorbing odors. The egg shell is porous and permits loss of moisture from the egg as well as absorption of odors from the surrounding atmosphere. Preventing loss of quality and spoilage starts with producing clean sound eggs. Refrigeration is the best known method of preserving the quality of eggs. Low storage temperatures of 29° to 31° F. and humidities of 85 to 92 percent are recommended. Treating the shell with oil is a fairly recent practice to improve storage by retarding moisture loss and by building up a low concentration of carbon dioxide within the egg from respiration. Heat treating shell eggs to stabilize the white and kill the embryo is another method devised for prolonging storage life.

Grains and Seeds

Grains and seeds, under proper storage conditions, remain dormant. But if sufficient moisture is absorbed and temperatures are favorable, germination takes place. Then they are extremely high in respiration and heat output. Moisture uptake favors mold and bacterial activity, and insect damage.

Advances have been made in handling and storing grain by recognizing the limits of moisture content safe for storage, and by drying the grain to a safe moisture level. These levels are 13 percent or less for wheat, oats, shelled corn, and similar grains, and 11 percent for soybeans for storage in midwestern and northern areas. If these grains are to be stored for seed purposes, moisture contents 1 or 2 percent lower are required. Dry beans should have a moisture content of not more than 17

percent.

Meats, Poultry, and Fish

Preventing spoilage and loss of quality in meat, poultry, and fish is largely a microbiological problem. Sanitation in preparation for market, quick and adequate refrigeration, and good packaging are the essentials for preventing loss of quality. Desiccation from exposure to dry air is another factor of importance in these commodities. Avoiding exposure of meat, poultry, and fish to high air velocities and low humidities for long periods and the use of moisture-vapor resistant films in packaging have been of benefit.

Sweet Potatoes

Sweet potatoes have the property of healing their wounds by growing new cells. Curing of sweet potatoes after digging accomplishes this, as well as bringing about chemical and physical changes that enhance quality. Sweet potatoes should be held 10 days at 85° F. and 90 percent humidity after digging. Re-curing after handling or packing helps to control decay. Sweet potatoes should not be exposed to temperatures lower than 55° F. for more than a few days because of the danger of chilling injury, with resultant decay and poor quality.

Tomatoes

Most tomatoes are shipped in the mature green stage of maturity. To get the best quality, mature green tomatoes should not be held at temperatures lower than 55° F., and they should be ripened at 65° to 70°. Any attempt to hold back ripening by using temperatures of 50° to 45° F. will result in poorer quality of the ripened product and an increase in decay.

Many shipments of tomatoes may get into trouble with decay if they are a long time in transit under refrigeration. The tomatoes will look sound. But when they ripen, decay develops. If tomato shippers and prepackagers would never completely stop the ripening process they would save losses and get better quality tomatoes to the consumer.

Potatoes

Potatoes, given a chance, heal their own wounds. All that is required is a moderate temperature of about 55° to 75° F. and reasonably high humidities. New cells are formed and the wounded areas cork over in a week or more. For this reason, it is not advisable to cool freshly dug potatoes quickly to, say, 40°--their best storage temperature.

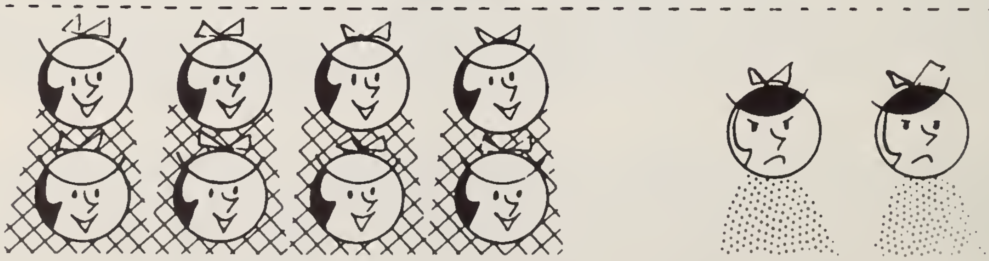
Let them cool gradually to this temperature. But get them down to 65° to 70° as soon as possible. High temperatures can increase decay and physiological troubles. Hydrocooling of potatoes was experimented with in California a number of years ago, and other methods of cooling have been practiced. Cooling the tubers to lower than 55° or 60° does not improve market quality. It interferes with the healing process.

Reactions of Homemakers to Frozen Grapefruit Sections

5 out of 10 were aware product was available in stores

2 out of 10 purchased the product

7 out of 10 who bought made repeat purchases



8 out of 10 who bought were satisfied with the taste

Introducing A New Food Product

By Robert E. Branson, Milton Jacobs, and Richard Hall

Here's how frozen grapefruit sections were introduced into the market:

Processors chose the new food product with care. They made sure, in the first place, that they had a quality product. Then they packaged it in an attractive container.

The U. S. Department of Agriculture, assisting the citrus industry in appraising the potential market for this product, selected Erie, Pa., as the test market.

The citrus industry and Erie retailers advertised the product on radio, television, and in newspapers. They demonstrated it in the stores --homemakers tasted samples. USDA researchers checked the sales of the new product with competing products and surveyed test area homemakers to get their reactions to the product.

Erie, Pa., homemakers got to know frozen grapefruit sections this way. They liked them, and they bought them.

That's what USDA's Market Development Branch, Agricultural Marketing Service, found when it surveyed homemakers and retail stores in Erie.

Researchers asked homemakers if they knew about the product, if they bought the product, and if they liked the product. They checked sales data in the retail stores to test the effectiveness of the various types of promotion and to see if citrus growers could sell more grapefruit through this new outlet, or whether the new sales would mean less sales for other grapefruit products.

Half of the Homemakers Knew About the Product

Here are some of the highlights of the survey of Erie homemakers:

Half of the homemakers interviewed knew about the product.

Five in every 10 who knew about the product had seen the actual product in a store, on a poster or display sign, or in a newspaper ad; about 3 in 10 had seen it advertised and demonstrated on television; 2 in 10 had heard about in on the radio, or a friend had told them about it.

More than 8 in every 10 who saw a demonstration or tasted a sample in the store made their first purchase then and there, or before leaving.

Two in every 10 homemakers interviewed had bought frozen grapefruit sections.

Seven out of 10 who bought once bought again.

Eight out of 10 who bought were satisfied with the taste.

An audit of Erie retail store sales, made by the Market Development Branch, indicated a market there for frozen grapefruit sections. The data showed that the new product increased the overall sales of grapefruit in the Erie market. The sales rate of the new product compared favorably with canned grapefruit sections, with about the same number of cases sold for both products. The number of homemakers buying the frozen sections in place of canned sections was relatively small. Sales of the new product, compared with other frozen fruits, ran second only to frozen strawberries through the whole test period.

Need for New Markets for Grapefruit

The Department made this marketing research study at the request of the citrus industry. In the summer of 1954, two of the larger citrus processors in Florida packed a limited quantity of frozen grapefruit sections in 10-ounce cans. Only select fruit was used with a sugar-sucrose formula added as a carrier and preservative.

This new product was developed as part of a citrus industry program to sell more grapefruit by developing new markets. It was shipped to food stores in Erie, where USDA did the market testing for consumer acceptability and probable demand.

Four-Week Promotional Program

The citrus industry conducted a 4-week promotional campaign through ads in local newspapers and on local radio and television programs. It also sponsored store promotions and demonstrations or taste samplings of the product from special displays. Four weeks after the end of the promotional campaign, the household survey was made.

Two weeks before the stores were stocked with the new product the Market Development Branch made weekly audits of prices and sales of fresh, canned, and frozen fruit and juice products that might compete with the new product. These provided a scale for measuring sales in succeeding weeks. Two weeks after these were completed, the researchers resumed the weekly audits. They continued them for 11 weeks, to allow time for sales to fall to their normal level after the 4-week promotional campaign.

The reactions of the homemakers surveyed and the volume of sales of the new product during and after the promotion period indicated that a potential market for frozen grapefruit sections exists.

Riper Peaches For Retail Sale

By W. H. Redit, M. A. Smith, and P. L. Benfield

Riper peaches for retail sale through precooling and refrigeration in transit - - that's the goal of the peach industry, State research and marketing organizations, and the U. S. Department of Agriculture. Currently, the Department's research is directed at developing the best methods of precooling peaches before shipment, refrigerating them during transit, and determining the effects of these practices in preventing decay.

Generally, it is known that the development of decay in ripening peaches is retarded by refrigeration. The faster field heat can be removed and the fruit maintained at lower temperatures the less decay there will be during shipment. This is confirmed by a report now available on the Department's studies in South Carolina and Georgia.

Hydrocooling Tests

There are a number of methods of precooling peaches. Hydrocooling, the using of ice water to flood or immerse peaches, is a rapid method. Hydrocooling tests were made with 2 types of commercial hydrocoolers and 2 homemade hydrocoolers, all using ice for refrigeration. One mechanically refrigerated hydrocooler and one tank-type hydrocooler were also tested.

The average reduction in peach temperature for all types tested except the tank hydrocooler was 33.1° F., with a range of 19.4° to 43.4°. The average final fruit temperature was 50.2°. The coefficients of cooling, expressed as fruit temperature reduction per hour per degree F. difference between average water and fruit temperature, varied from 3.32 to 6.91.

The commercial units were similar in design, differing only in the construction of the ice tanks. In both units, the peach containers were placed on a wide, slatted conveyor and moved through a heavy flood of water released from an overhead distribution tank. The performance index of these units was below that of the homemade units. It decreased as the size of the container increased.

The homemade hydrocoolers were similar to the commercial units but moved the fruit on individual chain conveyors on one side and returned it through the unit on the opposite side. The performance of these coolers, as expressed by their cooling coefficients, was relatively good. The average cooling coefficient was the highest for any of the types tested.

In the mechanically cooled unit, water was cooled by circulating

Placing bushel baskets of peaches in a commercial hydrocooler.

through a converted milk cooler. Losses resulting from use of a water cooler separate from the main tank could be prevented by placing the cooling coils directly in the tank.

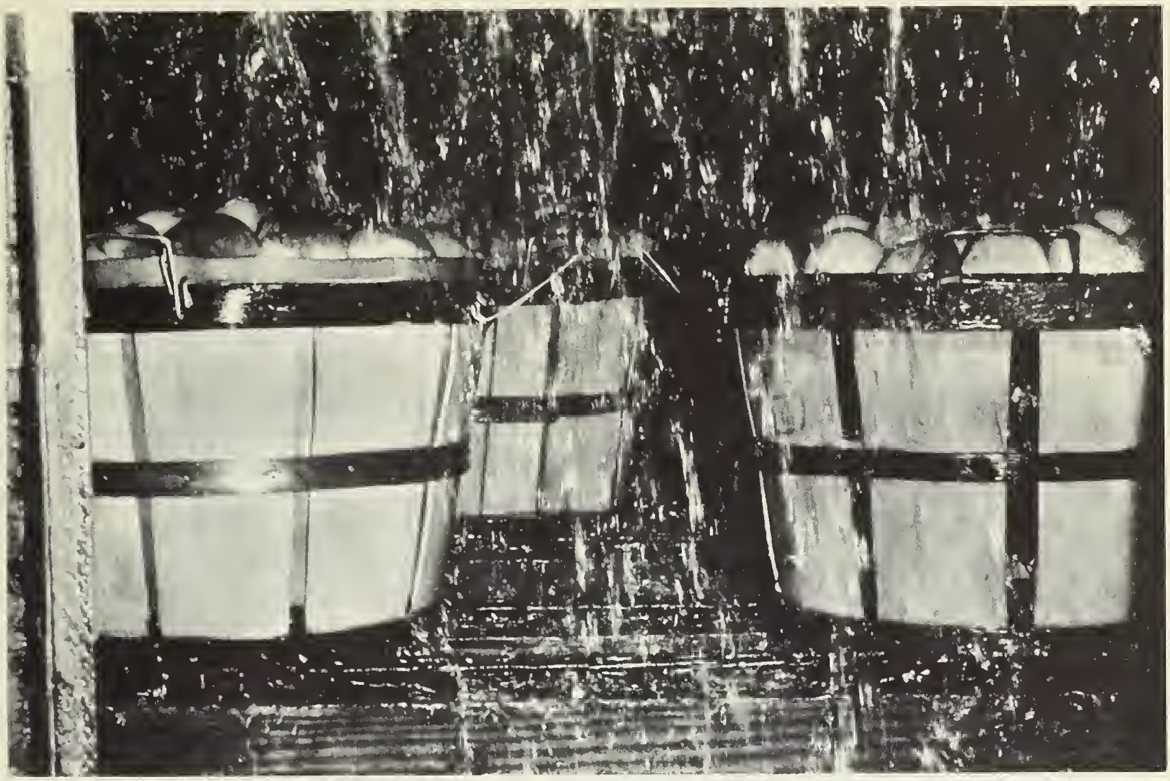
Approximately 1.5 pounds of ice were required to cool 100 pounds of peaches 1° F. according to icing records obtained on 4 hydrocoolers.

An immersion type hydrocooler for lidded baskets of peaches was also tested. The cooling coefficient in tank coolers was low as compared with that in flood-type coolers, chiefly because of the relatively slow movement of the water around the peaches. Bushel baskets cooled better than 1/2-bushel baskets, probably because the smaller ones floated up against the top of the frame.

Wetting Agents Offer Promise

In 2 of 3 tests two wetting agents gave promise of increasing the cooling effect of the water, but need for an anti-foam agent was apparent.

No appreciable temperature rises were noted when hydrocooled peaches were conveyed 300 feet while exposed to high air temperatures. Temperatures of peaches stacked on the packinghouse floor after cooling rose 10° an hour. The temperatures of peaches held overnight in partially loaded iced cars did not rise appreciably. Every effort should be made to preserve the refrigeration accomplished by hydrocooling.



Peach temperature is being reduced by the flood of ice water.

This calls for minimum exposure of the fruit to high air temperatures, by loading in preiced cars and trucks, and by keeping truck doors closed except while actually loading.

Hydrocooled peaches loaded in a mechanically refrigerated car at 50° were further cooled to about 42° in 18 hours.

Loading Temperatures Maintained Satisfactorily

Four of the 5 truck shipping tests were with hydrocooled fruit. Loading temperatures were maintained satisfactorily in transit. In 3 tests average ice consumption in transit varied from 134 to 156 pounds per hour. In another test, warm fruit loaded in one truck at an average temperature of 73.7° was reduced to 52° during 30 hours of transit. Average ice consumption was 360 pounds per hour. With satisfactory transit temperatures in all trucks, the loads arrived in good condition, with almost no decay. After 4 to 7 days holding at destination, decay increased from 6 to 40 percent in the test shipments.

There appeared to be little correlation between the amount of decay and the method of cooling. Differences were probably due to variations in the orchard infection of the fruit used in different tests. It should be noted that the maximum of 40% decay occurred in fruit held at 82° after arrival at the market. In the other 4 tests the fruit was held at 70° and there was less decay.

Truck Routing By Code

By Theodore H. Allegri

High costs for local truck deliveries are frequently due to improper dispatching. If a distributor adds this to the cost of office work entailed in routing delivery trucks he has compounded his delivery expenses. Most distributors will maintain that they are selling service. For this reason they cannot crystallize their delivery schedules. They will say that the delivery stop numbers they place on their invoices cannot be held to hard and fast because there are often rush orders. Yet they do code their invoices and their dispatchers try hard to make the codes work.

One large volume frozen food distributor has stuck to his guns, and hard and fast to his delivery schedule. He is using the 5-digit route sequence sorting code outlined below. He is convincing his customers that the lower price they pay for their merchandise due to the lower cost of dispatching and delivery is worth more than limited service at a higher price.

Sorting and printing invoices from punchcards on automatic accounting machinery by a predetermined code is more efficient than sorting and stamping numbers by hand on an invoice form. But the code may be profitably used by distributors coding by hand or machine.

The majority of frozen food distributors who use automatic accounting machines invariably code the delivery stop number or geographic location of the customer for use with their printed invoices. The sequence code is used by the dispatcher to sort the invoices according to their delivery stop number. The business of location coding, or delivery-sequence coding, can become a chore and a nuisance almost overnight. The reason for this is that the coder usually provides one, two, or three numbers between stops, or between groups of stop numbers. And then finds, to his dismay, that merely leaving a few numbers is not sufficient. Bulking of stop numbers between the originally prescribed stop numbers occurs and his system then becomes rather unmanageable.

A simple flexible code has been devised that provides effective, continuous coding of new locations and does not require the reassigning of old numbers. It does not require a periodic overhaul to consolidate active numbers or drop out inactive delivery stop numbers. Delivery stop numbers, or an account code number, are assigned to each customer in this manner: First, the area designation is given in the first two digits. Numbering from 00 to 99 will permit the distributor 100 trucks, truck

routes, or area designations. The next three digits indicate the delivery stop number. The person doing the coding should start with the two digit numbers preceded by a "0" - for example, 010, 020, 030 and continue numbering by tens up to the last active account. Thus the initial truck routing sequence, or delivery stop sequence, is established.

Original Assignment of Delivery Stop Numbers

This digit column is not part of the code, but merely serves to indicate the delivery stop sequence	Area designation, or truck No. 12		Delivery stop number		
1	1	2	0	1	0
2	1	2	0	2	0
3	1	2	0	3	0
4	1	2	0	4	0
5	1	2	0	5	0
6	1	2	0	6	0
7	1	2	0	7	0
8	1	2	0	8	0
9	1	2	0	9	0
10	1	2	1	0	0
11	1	2	1	1	0
12	1	2	1	2	0
13	1	2	1	3	0
14	1	2	1	4	0
15	1	2	1	5	0
to					
99	1	2	9	9	0

The next step considers the addition of new customers' stop numbers. If only one customer has been added between any of the present delivery stop numbers, 5 units are added to the next closest stop number to get the new account number or delivery stop number.

One Stop is Added Between Two of the Original Stop Numbers

This digit column is not part of the code, but merely serves to indicate the delivery stop sequence	Area designation, or truck No. 12		Delivery stop number		
1	1	2	0	0	5
2	1	2	0	1	0
3	1	2	0	1	5
4	1	2	0	2	0
5	1	2	0	2	5

6	1	2	0	3	0
7	1	2	0	3	5
8	1	2	0	4	0
9	1	2	0	4	5
10	1	2	0	5	0
11	1	2	0	5	5
12	1	2	0	6	0
13	1	2	0	6	5
14	1	2	0	7	0
15	1	2	0	7	5
to					
199	1	2	9	9	5

It is apparent from the column of numbers on the extreme left-hand side of the code that there are now 199 delivery stop numbers. These numbers correspond to the physical location of the customer.

It may become necessary to add several more customers to the routing sequence. Further additions have been made to the delivery stop code, and it is important to note that these are 03 and 07 so that the series now become 12003, 12005, 12007, and 12010. This makes a total of 399 delivery stop numbers that could be made.

Additional Stops are Added

This digit column is not part of the code, but merely serves to indicate the delivery stop sequence	Area designation, or truck No. 12		Delivery stop number		
1	1	2	0	0	3
2	1	2	0	0	5
3	1	2	0	0	7
4	1	2	0	1	0
5	1	2	0	1	3
6	1	2	0	1	5
7	1	2	0	1	7
8	1	2	0	2	0
9	1	2	0	2	3
10	1	2	0	2	5
11	1	2	0	2	7
12	1	2	0	3	0
13	1	2	0	3	3
14	1	2	0	3	5
15	1	2	0	3	7
to					
399	1	2	9	9	7

To provide code space for the stops that are bulked in a small geographic area we have the final coding in which 9 delivery stop numbers have been placed between each of the originally assigned numbers.

Periodic Additions Have Expanded the Code

This digit column is not part of the code, but merely serves to indicate the delivery stop sequence	Area designation, or truck No. 12		Delivery stop number		
1	1	2	0	0	0
2	1	2	0	0	1
3	1	2	0	0	2
4	1	2	0	0	3
5	1	2	0	0	4
6	1	2	0	0	5
7	1	2	0	0	6
8	1	2	0	0	7
9	1	2	0	0	8
10	1	2	0	0	9
11	1	2	0	1	0
12	1	2	0	1	1
13	1	2	0	1	2
14	1	2	0	1	3
15	1	2	0	1	4
to					
1000	1	2	9	9	9

How the Code is Expanded

Original assignment of delivery stop numbers	A stop between two of the original stops is added	Several stops are added on the best truck route	Periodic additions are made with this result
12010	12010	12010	12010
12020	12015	12013	12011
12030	12020	12015	12012
		12017	12013
		12020	12014
			12015
			12016
			12017
			12018
			12019
			12020

Hauling Florida Produce By Rail And Truck

By Ezekiel Limmer

Trucks carry a good share of the fresh fruits and vegetables produced in Florida to the 48 States and the District of Columbia. They carry most of the Florida produce going to Atlanta, Ga., 600 miles away. They also carry oranges and grapefruit to Los Angeles, over 2,700 miles away. But 30 years ago, the bulk of the Florida produce was hauled by rail.

Many reasons have been advanced in explanation of the diversion from railroads to trucks. Although faster and more flexible service by trucks is sometimes indicated as the chief reason, lower transportation charges for movement by highway are always reported as an important influence.

A recent report issued by the U. S. Department of Agriculture compared truck and rail charges in 1952 for 8 important Florida fruits and vegetables--cabbage, celery, corn, grapefruit, oranges, potatoes, snap beans, and tomatoes--shipped from Florida to markets in Atlanta, Baltimore, Boston, Chicago, Cleveland, Dallas, Denver, Detroit, Los Angeles, New Orleans, New York City, Oakland, Philadelphia, Portland (Oregon), St. Louis, San Francisco, Seattle, and Washington, D. C.

This report indicates that the difference between rail and truck charges has contributed to determining the relative shares of the fresh fruit and vegetable traffic moving by rail and truck.

Charges for Shipping by Rail Generally Higher Than by Truck

Charges for shipping by railroad, in 1952, were generally higher than truck charges for most of the principal fresh fruits and vegetables produced in Florida. Rail shipping charges typically were higher to important eastern, southern, and midwestern markets lying in the area to which the bulk of these commodities was shipped. However, to western markets trucking charges generally were substantially above rail shipping charges.

The Longer the Haul, the Less the Truck Advantage

To the nearer markets, the truckers generally offered lower rates than the rail charges and hauled a greater volume than moved by rail. To the more distant markets, truck rates were usually above the rail charges. Rail movements were of greater volume than truck movements to those markets.

From Sanford, Fla., it cost the shipper 80 percent more to send oranges to Atlanta by rail than by truck. As the distance increased, this spread between rail and truck charges generally narrowed. To send oranges to Boston, over 1,300 miles from Sanford, it cost the shipper only 1 percent more to use the railroads than trucks.

However, at Dallas, almost 1,100 miles away, rail charges on oranges from Sanford were 51 percent above truck rates. Railroad charges to Dallas were higher than to other markets at a similar distance. The excess of rail charges over truck charges to Dallas was relatively high for many of the commodities.

But There Are Exceptions

The rail charges from Florida to Los Angeles and San Francisco were substantially below truck rates. But these cities received the bulk of their Florida fruits and vegetables by truck.

These and other exceptions were apparently due to factors other than rates. One of the most important of these nonrate factors is speed. Because they are not in the main line of movement of Florida shipments, cities in the Far West do not receive the direct, expedited rail service enjoyed by various eastern, southern, and midwestern markets. This gives trucks a bigger advantage in speed of service than they have at other markets a long way from Florida.

There were additional nonrate factors which differed among markets. Some wholesale markets near Baltimore, Detroit, Philadelphia, and perhaps other cities restricted the entry of trucks or barred them from using certain market facilities. Such practices hold down the truck share of traffic.

An Explanation of Rail Charges Used Here

Basic freight rates are only part of what it costs a shipper to send fruits and vegetables by railroad. To see what is the full amount of this expense in the movement from packing houses to wholesalers, except for loading and unloading costs, two things must be added to the railroad rates. One is the separate charge railroads make for refrigeration. The other is local cartage costs, the charge for hauling the produce from the railroad to the wholesale warehouse.

Truckers lump together what they charge for hauling the produce from one town to another, and what they charge for refrigeration. Furthermore, since trucks generally provide store-door delivery, no additional cartage is necessary when a shipment arrives by truck. This study did not add anything to the truck rates.

Rails, Trucks Share Traffic in Different Proportions

For the year studied, 1952, the share of the traffic of Florida produce hauled by railroads and trucks differed widely among various comodities and markets. Rail unloads ranged from 33 percent for snap

U. S. Department of Agriculture
Agricultural Marketing Service
Washington 25, D. C.

OFFICIAL BUSINESS

Penalty for private use to avoid
payment of postage $300

beans to 83 percent for celery. The rail proportion for grapefruit was 74 percent, oranges 73 percent, tomatoes 65 percent, corn 60 percent, potatoes 64 percent, and cabbage 59 percent.

Generally railroads hauled a smaller proportion of the total volume to the near markets than to those farther away. For tomatoes, rail unloads ranged from 1 percent at Atlanta to 100 percent at Seattle; for oranges, 9 percent at Atlanta to 100 percent at Portland.

Some markets did not fit into the mileage pattern for certain commodities. The lowest proportion of rail unloads for grapefruit, 1 percent, was at Dallas. Atlanta, about 675 miles nearer to Florida shipping points, received 10 percent of her grapefruit by rail. Los Angeles and San Francisco received the bulk of their Florida tomatoes, grapefruit, snap beans, and green corn by truck.

A single copy of the report, "Railroad and Truck Rates and Movements of Fresh Fruits and Vegetables," AMS-53, may be obtained free from the Marketing Information Division, Agricultural Marketing Service, U. S. Department of Agriculture, Washington 25, D. C.

☆ U. S. GOVERNMENT PRINTING OFFICE : 1955 - 561878